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Senate

(Legislative day of Monday, July 10, 1995)

The Senate met at 9:30 a.m., on the expiration of the recess, and was called to order by the President pro tempore [Mr. THURMOND].

PRAYER

The Chaplain, Dr. Lloyd John Ogilvie, offered the following prayer:

Let us pray:

Gracious Father, whose presence and power is revealed to the heart that longs for Your guidance, to the mind that humbly seeks Your truth, and to those who are united in oneness to serve You in a great cause, we ask that this time of prayer be an authentic experience of communion with You that issues into an inspiring conversation with You throughout the day.

We seek to receive Your presence continually, to think of You consistently, and to trust You constantly. We urgently need divine wisdom for our leadership of this Nation, and we have discovered that this only comes in a reliant relationship with You. Prayer enlarges our minds and hearts until they are able to be channels for the flow of Your spirit. You Yourself are the answer to our prayers.

As we move through this day, we seek to see each problem, perplexity, or person as an opportunity to practice Your presence and accept Your perspective and patience. We do not want to forget You, but when we do, interrupt our thoughts and bring us back into an awareness that You are waiting to bless us and equip us to lead with vision and courage. Thus, may our work be our worship this day.

In Your holy name. Amen.

RECOGNITION OF THE ACTING MAJORITY LEADER

The PRESIDENT pro tempore. The able senior Senator from Alaska is recognized.

SCHEDULE

Mr. STEVENS. Mr. President, this morning there will be a period for morning business until the hour of 10 a.m. At 10 a.m., the Senate will immediately begin a rollcall vote on the motion to invoke cloture on the State Department reorganization bill. The Senate will recess between the hours of 12:30 p.m. and 2:15 p.m. for the weekly policy conferences. If cloture is not invoked in the morning, a second cloture vote will begin at 2:15 p.m. immediately following the recess. If cloture is not obtained, the majority leader has indicated the Senate may resume consideration of the energy and water appropriations bill or begin consideration of the Department of Defense authorization bill. Rollcall votes can, therefore, be expected throughout the session today.

Also, as a reminder, Members have until 10 a.m. this morning to file second-degree amendments to qualify postcloture and until the hour of 12:30 p.m. today to file first-degree amendments under the cloture procedure.

MORNING BUSINESS

The PRESIDING OFFICER (Mr. CAMPBELL). Under the previous order, there will now be a period for the transaction of morning business, not to extend beyond the hour of 10 a.m., with Senators permitted to speak for up to 5 minutes each.

Under the previous order, The Senator from Ohio, Senator GLENN, is recognized to speak for up to 15 minutes.

BENEFITS OF NASA-FUNDED RESEARCH

Mr. GLENN. Mr. President, I rise today to begin a series of statements in which I want to outline some of the research and other scientific benefits derived from NASA-funded programs. These are programs that have benefit, by and large, for every man, woman, and child in this country; indeed, for people all over the globe.

I note with pleasure that just recently, the House passed their appropriations bill regarding NASA's space station by a vote of 299 in favor and 126 against. That is well over a 2-to-1 margin. I hope we can match that in the Senate.

But every year in the Senate, when the time comes to consider the NASA budget, there are those doubters, there are those people who want to cut it. I do not want to see excess money going into NASA either, but I also think we need to step back once in a while and look at what we are talking about with regard to research.

If there is one thing this Nation should have learned throughout its history, it is that money spent on research usually has a way of paying off in the future beyond anything we can see at the outset. That is just as true with research in space as it is with research that we have done in other areas. Research by its very nature is not as amenable to cost accounting procedures as are some other programs. But that is why it is research: It is looking into the unknown, it is having inquiry into things we do not yet know about and do not yet know the value of. Yet, that has been at the heart of every bit of advance in science and technology that we have ever made as a nation.

Someone has to wonder, someone has to have a curiosity about what we do not know in a certain area, how can we do things better, what would happen if we knew the answer to a certain question. And they are willing to go out and do something about it. They are willing to exercise their wonderment, their curiosity. This Nation is just replete with examples of where that has been to our advantage.

For example, we can think back in agriculture and we can see the old settlers planting corn. When I was a boy back in New Concord, OH, a good corn crop was probably 48 to 50 bushels per acre. That was considered pretty good around there in those days. Do you know what it was last year not far from where I grew up? There was one farm pointed out to me that won the competition in that little part of our State near Utica, OH, where our good friend, Gene Branstool, who was in the Department of Agriculture for awhile, comes from. That area had 239 bushels per acre last year on one of the farms—239 bushels per acre.

Back when I was growing up, the people thought 48 to 50 bushels was pretty good. Why do we need research? Why would anybody spend money on it when we are getting 48 to 50 bushels off this land, where people before had only 30 or 35? But we put money into an agricultural research system, and out of that system came improvements in soil and fertilizers and hybrids, a tremendous step forward when you got to hybrids.

So the increase in production is not something that indicates farmers are working six or seven times as hard as they worked back when I was a boy, but it means that we did basic research, even though nobody knew what the outcome of it was going to be at that time.

Out of that research then came improvements in the hybrids, machinery, fertilizers, soil stabilization, and all these things that give us this wonderful production today that makes us the envy of the world. We are not the envy of the world just because—just because—we have great plains on which to conduct all of our agriculture. We have that agricultural production out there largely because we did basic research more than anyone else in the world, and we are the envy of the rest of the world with that system that we set up in agriculture.

I can give other examples. In metals, we develop metals that now give more reliable engines, valves, and generators, and all the things that go to make up our industrialized society. We did metallurgical research that was the envy of the rest of the world. Now there are some places in the world, Russia being one of them, where we envy them in some of the metallurgical research they are doing. In some areas, we believe they are probably ahead of some of our metallurgical research.

Aeronautical research—why would anybody want to get up and fly like the birds? The Wright brothers wondered why not and then did it. That first flight they made was 120 feet long and took 12 seconds. Before that day was over, they had done four flights, the longest one just a little under 900 feet, 59 seconds I believe it was. But they were curious about why we could not get up and do sustained flights. People have wondered for thousands of years, I suppose, why we could not fly like the birds.

The Wright brothers were curious about it, and they were ridiculed by some of the people at the time, because why would anyone want to do this? Later on, when they were trying to sell one of the airplanes, or a series of them, to the Army to use and were in Washington demonstrating it, one of the people in Congress in one of the hearings was quoted as saying, ''Why not just buy one airplane and let them take turns using it?''

Well, it shows how myopic the view is of some people. The airplane was developed in part because we did basic research. Out of that start came an aeronautical industry that, in turn, had its own research done. The Government invested in wind tunnels and conducted lift experiments and drag experiments and metallurgical experiments along with some of that to see what would hold up in a wind tunnel. Out of that came the lifting bodies and the aerodynamic surfaces that were the basis of our whole aeronautical industry and helped develop such giants as Boeing, Lockheed, Grumman, Northrop, McDonnell-Douglas, and all the rest of the aviation companies that did not do all of that themselves. They could not. They did not have the resources. Yet, the Government went ahead with the research that let this whole new industry develop.

In medicine, we have had people concerned since we have been a nation in doing more medical research than any nation. Out of that has come a medical system that is the envy of the world. At the same time, we have problems with it because we want to see more people benefiting from that system. But we have made our medical advances and breakthroughs largely because of basic, fundamental research. We have people willing to go into the laboratories and conduct that kind of research in oceanography, for example.

Those who would think that just because we have moved into this new environment of space—there are some who think we should lay that down and it cannot possibly have any advantage to us. Yet, we have found in the past that exploring the unknown, whether it be in the lab or geographical expansion—can be just as valuable as any of the other kinds of research that we do. But we still have those who doubt.

I am reminded of a quote that is sort of a favorite of mine because it shows how myopic some views can be. It involves Daniel Webster. He rose on the Senate floor when they were considering some territorial acquisitions from Mexico back in 1852. These were the lands beyond the Mississippi. These were the great plains beyond the Mississippi. These were the mountains and plains clear to the west coast. He did not like that idea very much. Daniel Webster rose on the Senate floor and spoke in opposition to the purchase. He is quoted as having said the following:

> What do we want with this vast worthless area, this region of savages and wild beasts, of deserts of shifting sands and whirlwinds of dust and cactus and prairie dogs? To what use could we ever hope to put these great deserts or the mountains that are covered to their very base with eternal snow? What can we ever hope to do with the western coast, a coast of 3,000 miles rock-bound, cheerless, uninviting, and not a harbor on it? What use have we for this country? Mr. President, I will never vote one cent from the Public Treasury to place the Pacific coast one inch nearer to Boston than it is now.

We look back today and think how myopic that view was. I am sure everyone that comes from States west of the Mississippi would first be amused by Daniel Webster's statement. It shows how myopic the views of even well-educated, great public servants can become when they try and just assume that the status quo is what we are going to live with forever, and should live with forever.

When we look up at space, in order to stay up there, you have to go fast enough to set up enough centrifugal force going around the Earth so that you balance gravity, so that, we now can assume a zero gravity or microgravity environment. You cannot do that here on Earth. You can throw something up in the air and for the time period it is going up and coming back down, it will be in a zero gravity condition or zero-G condition. However such experiments are very short-lived.

In the spacecraft we have now, whether it be the space shuttle or the coming orbiting space station, up there on a permanent basis, we now have the capability of exercising this curiosity, exercising our wonder, exercising our look into the unknown to see how it can benefit us here on Earth. That is the reason why I rise today, to talk about the value of this and some of the things that, even at this early stage of investigation, this early stage of research in space, is of value to everyone right here on Earth.

Let me take the last Space Shuttle flight that went up as an example. The last flight was called an ''Ohio flight'' because, as it turned out, four out of the five people on board were from Ohio. The flight was not set up that way, as an Ohio flight, to begin with. It was just the luck of the draw on that assignment of crew that it turned out that four of the five people were from Ohio.

I went down before their launch and spent a couple of days with that crew down at Houston. It was intensely interesting. We went through some of the simulations the astronauts use for training there, as well as reviewed some of the experiments and things they were going to do on that particular flight. This was not an unusual flight in that regard. It was a flight that had a number of experiments on board—a dozen or so—and some of them that may have a particular benefit to people right here on Earth.

The people on that flight were Commander Tom Hendricks from Woodville, OH; Nancy Jane Curry from Troy;

Mary Ellen Weber of Bedford Heights, Don Thomas of Cleveland; Kevin Kriegle from Amityville, NY, who we made an honorary Ohioan for the duration of that particular mission. They did a great job. Many people watched the other day as they landed successfully at the cape after being delayed in coming back because of weather.

But the important thing I want to stress this morning is that just on that one flight, some of the things they had aboard may be of extreme value to everybody right here. Actually, they had a total of 18 different experiments that were on board that flight. The primary mission was to put into space the TDRS satellite, the tracking and data relay satellite system. This is a final installation of a series of space-based communication and tracking networks that will be used for lower Earth orbit communications.

The amount of communications of data relay that that particular satellite will be able to handle, to me, is sort of mind boggling. Once it is fully up and fully operational—it is up there now but not fully operational—it will be used as a spare in case one of the other TDRS satellites develops problems. But its capacity, when fully operational, will be to transmit information per second, equal to about a 20 volume encyclopedia, to be able to transfer that amount of data per second. The communications that something like that provides and the ability to communicate with different parts of the world almost instantaneously is rather mind boggling to even consider.

I will not try and go through all 18 of these experiments, but another one I was particularly interested in—and that the scientists at NASA are very excited about—is the bioreactor system. We were briefed on that in Houston, and one of the scientists describing this says that if this comes through the way they think it may, this is Nobel Prize material. Well, it may well be. What it does is it makes a new way of studying cancer cells and other cells that are in the human body. It provides a new way of analyzing these cells and may lead to a new way of treating them.

The reason it is different is this. In a laboratory here on Earth, if you want to grow some cancer cells you usually must grow them on the bottom of a Petri dish. These cells grow in essentially a two-dimensional way. Scientists can then analyze the cells, but because they are two dimensional, they do not exactly replicate how these cancer cells are found in the body.

A two dimensional model is not the cells' natural environment. Cancer cells in the blood stream, cancer cells in a tissue, are surrounded by other body fluids, body parts.

With the bioreactor, researchers can grow cells in a three-dimensional environment, more similar to what is found in the human body. When cancer cells are allowed to grow in three dimensions, researchers can use different experimental techniques, different drugs or lasers or whatever, to see how these cells or tumors may best be treated. On a lab here on Earth a bioreactor has been used to grow small three dimensional breast cancer cells, but eventually the forces of gravity take over and these models fall apart. In a constant microgravity environment, like that of the space shuttle or space station larger cell clusters can be grown—more similar to what is found in the human body.

The first efforts at that are being done now, and were conducted with this bioreactor development system which flew on the most recent shuttle. Stated in other terms, the ability of a bioreactor to provide the environment and metabolic support required to grow and maintain mammalian cell cultures in microgravity.

This is a short statement, meaning, basically, what I said a moment ago. The experiments that they were starting on this last flight on STS–70 were with cancer cells. They want to see what reaction they get, how they can maintain the cells there, what reaction they have to different conditions, and so on.

Can I say right here that we have the answer to cancer near at hand, or the answer to AIDS near at hand? No. But out of an inquiry like this might well come some advances that combine with others, and other research may give us a handle.

Surely, this environment that they are in, where they are surrounded by the normal body fluids in the reactor, is much more conducive to research.

The effect of microgravity on bone development has been an ongoing area of research. Research into osteoporosis, which is a degenerative bone disease, is one prime example. One thing that happens in microgravity is the body starts to correct itself, as it no longer needs the same skeletal strength it has here on Earth to maintain itself up there.

We used to worry about this because if one's body eliminated enough calcium and the bones became much less rigid, we used to joke about the possibility of ''jelly bones.'' Sometime in the future if a person went on a long space flight, maybe you would come back and your bones would be so weak, so much calcium was out of them, you might not be able to stand without taking a chance of breaking your leg.

Osteoporosis goes through much of this same process. Prolonged bed rest in the hospital creates some of that same process—the body throwing off much of the calcium that it has in its bones.

In space, you develop some of these characteristics much more rapidly. That is the reason why you see some of the pictures coming back, people are up there exercising, exercising, exercising, about an hour every day on a treadmill, tied down with bungee cords, because they find that hard exercise every day is the best way to prevent that from happening.

Here on Earth, one of the ways people prevent osteoporosis is by daily exercise. Up there, we can then use additional chemicals or medicines or whatever to see if we cannot reverse this process or at least prevent it from happening, which will have a direct relationship right here on Earth.

Another experiment, commercial protein crystal growth. Crystallized human alpha-interferon protein. The protein crystal growth experiments have been particularly interesting. These crystal growths occur with more purity and sometimes in much different size in the weightlessness of space than they do here on Earth. It opens up a whole new area of experimentation with regard to what may be of benefit right here on Earth. This particular crystal also may have some cancer benefits.

All of these things are not just curiosities in space, to be applied in space. They are of benefit to people right here on Earth. It always surprises me when people do not seem to want to realize or they talk down projects that may result in a whole new approach to disease. It may result in what we call tailormade drugs; in other words, drugs that will be tailored to a specific benefit to cope with a particular disease or a particular medical difficulty. They are doing those experiments there now.

Another experiment that has a title that is rather unwieldy may have some defense applications for us. We do not know yet. We think it may. It is called the HERCULES project. Now, HERCULES stands for hand-held, Earth-oriented, cooperative, real time, user-friendly, location targeting, and environmental system. That is some handle for the project HERCULES. What it is, is a space-based geolocating system to locate a wide variety of features on the ground with great accuracy. It has some defense applications that may come out of that, as well as other scientific applications.

Another experiment is microencapsulation in space to produce novel pharmaceuticals in a weightless condition which can be done with more purity than they can be done here on Earth.

Another one is a midcourse space experiment, which supports the development of surveillance capabilities of ballistic missiles during the midcourse of their flight. There are a number of experiments they perform on just that one flight.

Going back one flight before that, we all watched as astronaut Hoot Gibson flew the STS–71 mission, the shuttle-MIR mission. There were great pictures of that, that I am sure many of my colleagues saw. On that mission, in addition to just being able to rendezvous with two 100-ton vehicles coming together up there in space, they did metabolic experiments: Studying physiological responses in space, changes in blood volume, cardiovascular and pulmonary research, neurosensory research, how zero gravity affects brain

communication. Does that tie in with brain communication? We need information with regard to Alzheimer's disease or whatever. Also, behavior and performance research, long-term effects of microgravity on muscle coordination, mental acuity, and once again, the protein crystal growth experiments.

These are just a few of the things that are going on in the space program these days. I just mention these things now and, in subsequent remarks here on the floor, I want to give more information on some of these. I wanted to set the stage this morning by going back in just a few of the things that I have mentioned with regard to the value of basic research in this country, and that NASA is out there, right now, doing that kind of cutting edge, basic research, in this new laboratory of space.

Every year, NASA publishes a book called ''Spinoffs.'' This one is ''Spinoff, 1994,'' a whole book full of some of the things that NASA has been doing that are of value right here on Earth. Health and medicine, environment and resources management, public safety, consumer, home, recreational spinoffs, transportation, computer technology, industrial productivity, and manufacturing technology.

I will not try to read all the things here this morning for people, but I commend them to my colleagues and the staffs here on the floor for reading, to see what is going on in some of these areas. We will be talking more about some of these things as time goes on.

I know the time is limited here this morning. I will make some more lengthy remarks in days ahead. I wanted to take this time this morning to set the stage for the upcoming debate on NASA's budget.

People have looked up for hundreds of thousands of years and wondered what is up there in the air, and then the Wright brothers went ahead and learned how to fly and learned how to stay up there for a period of time, and people first thought, what use was it. But we know what use it became later on—our whole aircraft and airline industry that lets people travel to far places around the world.

Every time we come up with a new capability for doing research, it seems that there are those who do not want to recognize that something good may come out of it, whether it be agriculture research, metals research, aeronautical research, oceanography, geographical research, or whatever.

But, as I said starting out, if there is one thing this Nation has learned, it is that money and time spent on basic, fundamental research in whatever area usually comes back and shows more value than we could ever foresee at the outset.

Mr. President, I yield the floor.

TRIBUTE TO C. ABBOTT SAFFOLD, SECRETARY FOR THE MINORITY

Mr. HEFLIN. Mr. President, I rise today to join my colleagues in hailing the faithful service of Abby Saffold, who has served as secretary to the Democratic caucus since 1987. Abby has been one of the greatest fixtures in this body, and I cannot imagine the remarkably different place this Chamber would have been without her.

I remember well the days when this body was not so divided by party lines. Abby is a rare example of a person who provided her expertise to all, regardless of party. She did not concern herself with which side of the aisle we were on. She was helpful to anyone who needed of her.

I am sure Abby could tell remarkable stories about the questions that were posed to her throughout her career in the Senate. If someone was planning a vacation for 1999, they would first call Abby to ask if the Senate would be in session—and she would know. I am sure that she has been asked countless times ''When will be be out of here tonight?'' ''What's on the lunch menu today?'' or ''What's the best joke you can tell me, Abby?''

Abby has served as a school teacher and a case workers, and I am sure that those experiences have led to her expertise in working for and with Members of the Senate. She is well known for her endless knowledge of legislative procedures and negotiating skills, and for avoiding disaster through her expertise.

Abby was here with us all the late nights, still sharp, awake, and aware. There was no question whether she would be on the floor the next morning, and she was just as cheerful.

Abby is undoubtedly one of the brightest luminaries we have had the opportunity to work with here in the Senate. She learned from her experiences in Senator BYRD's office, working her way up from legislative correspondent to her position as the secretary of the majority, and most recently, as the secretary to the minority.

Senator BYRD taught her well. He passed on his attention for detail and professionalism to a truly great staffer. In appointing her, Senator BYRD gave us one of the greatest gifts any colleague could have—the opportunity for us to know the endless kindness of Abby Saffold. As Senator BYRD recently said, ''Abby has done it all, and done it all very, very well.''

As I look toward my own retirement, I would like to express by best wishes to Abby for hers. I doubt I will ever meet any finer person. We will all miss her presence here in this Chamber.

TRIBUTE TO DUANE GARRETT

Mrs. FEINSTEIN. Mr. President, only 48 years old, a veritable dynamo, exuding ideas and proposals, knowing his words commanded attention from the humblest abode to the White House itself, Duane Garrett seemed to have it all.

With a loving family, legions of friends, the respect and admiration of the lowly and highly placed alike, Duane appeared boundlessly blessed.

Lawyer, businessman, political adviser, art and stamp collector, sport savant, historian for the San Francisco Giants, fishing boat skipper—no one could fillet a salmon with such aplomb—radio talk show host, television commentator, Duane was a talented universalist—the proverbial Renaissance man.

Serious and thoughtful in his political analysis, witty and full of fun in conversation, a tenacious fighter for what he believed, yet practical and down-to-earth in his judgments, Duane was a true prodigy.

A giving man, always surprising friends with a gift—a stamp to a collector, a baseball card from a hero of long-ago to a young fan—but as only the generous can, Duane brushed aside gratitude. ''It was nothing. Just thinking about you,'' he would say.

And he would mean it because he gave from his heart.

With him, everything was done with enthusiasm born of interest in people and intensified by an endless curiosity about our world and our place in history.

He took to the microphone of his talk show with the same unrestrained gusto as he would enter a private conversation with an old friend.

He never held back. He always gave his all. He drew unselfishly from his knowledge and experience. Widely read and deeply thoughtful, he cut quickly and expertly to the heart of issues.

Certainly, I benefited from this ability as he advised me over the years, most recently as the cochair of my campaign for the U.S. Senate.

His candor could be counted upon. His word was his absolute bond. His thought was as rich and inventive as any person I know.

Also, he was a good friend, a person of great warmth and compassion. His mere walking into a room brought a brightness and warmth.

His bearish looming over a podium at a political dinner—and he was master of ceremonies at countless of them for me—was sure to give instant vibrancy to festivities. He was a master not only of long range ideas and concerns, but of the moment.

Actually, when his many talents and attributes are added together, the sum seems larger than life.

That makes his loss all the greater.

A giant who suddenly, without hint or warning, silences himself inevitably conjures a mystery.

But even in death there can be no detraction from what he contributed to life, no diminution of his love for Patty and his daughters, Laura and Jessica; no devaluation in the worth of the counsel and friendship he gave, or of the affection and respect he received in return.